

**APPARATUS AND METHOD FOR CONTINUOUS FORMATION
OF COMPOSITES HAVING FILLER AND THERMOACTIVE
MATERIALS, AND PRODUCTS MADE BY THE METHOD**

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ABSTRACT

An apparatus and method for continuously forming composites comprising filler materials and thermoactive materials, particularly waste cellulosic materials and waste thermoplastics, are described. One embodiment of the apparatus includes either a batchwise or continuous mixer, such as a cyclone, for forming mixtures comprising filler and thermoactive material. The mixtures are conveyed to a continuous consolidation apparatus. Alternatively, the mixtures may be densified in a densifying apparatus before entering the consolidation apparatus. The consolidation apparatus includes a hot-gas distribution system having plural paired gas cells, such as rollers or hoods, for applying hot air to the charge. A first cell of each pair applies gas to the mixture. The second cell of each pair operates at a pressure less than that of the first cell, thereby creating a pressure differential across the charge. Certain embodiments of the apparatus include at least one set of baffles positioned adjacent a cell, at least one shroud positioned about a cell, or at least one set of baffles positioned adjacent a first cell and at least one shroud positioned about a second cell. The baffles and shrouds are used to eliminate or substantially reduce the amount of gas that is vented to the surrounding atmosphere. The method comprises continuously consolidating the mixtures by applying a hot, dry noncondensable gas to the mixture. Besides the filler material and the thermoactive material the mixture may further include materials selected from the group consisting of biocides, fungicides, fire retardants, conductive materials, pigments, water retardants, wax-like materials, coupling agents, crosslinking agents, and combinations thereof.

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